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FOREST INSECT INVESTIGATIONS

March 30, 1932.

ANNUAL FOREST INSECT STATUS REPORT

Season of 1931

By
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I N T R O D U C T I O N

This report has been prepared as in the past with the idea of summarizing the insect status reports which are submitted annually from the Ranger Districts of Region 1. This is the eighth year that these reports have been submitted, and a valuable record been compiled from them depicting the status of existing conditions. A card summary of these reports maintained at the Forest Insect Field Station, Coeur d'Alene, Idaho, provides an excellent and valuable historical reference. During these eight years there has been a marked improvement in the character of the data submitted, which indicates a greater interest in the forest insect problem.

Though the 1931 reports were satisfactory, there are improvements which can be made in securing and submitting these data. It is believed that there may be a tendency to consider the presence of a few infested trees as constituting but a normal or endemic infestation. Until the actual status of an infestation is determined, the presence of successfully attacked trees must be viewed with alarm. The danger of such hasty decisions, based upon casual observations, lies in the fact that serious destructive outbreaks develop in a very few years from such apparent, normal infestations. Such outbreaks are often preventable and require not only large sums of money for suppression, but are difficult to control. Therefore, it is to these reports that

one must turn for information to permit prompt institution of control.

However, if such reports are to be of value, they must be based upon reliable, extensive data, and it is believed that each ranger should be permitted to devote sufficient time to this project in order to satisfy himself as to existing conditions. Though special training is not necessary, it is essential that the reporting officer fully realize the seriousness of his task and assume full responsibility for the data. It would seem that all infestations reported would call for some field work, which in many instances can be secured in a few hours. As it is difficult to distinguish between normal or endemic infestations, and the start of serious epidemics, the greatest chance of serious error lies in considering an increasing infestation as a normal condition.

SUMMARY OF RANGER REPORTS

1931.

One hundred and fifty reports were received from 105 ranger districts. Of these, 20 were negative in character and 130 listed infestations of various insects. Of the 130 reported insect infestations, 48 were considered as increasing, 40 as decreasing, 15 as normal, and 17 considered by the writer as being duplicate reports of the same infestation within the same ranger district. There were 18 recommendations for control, while on the other areas, control measures were not considered as being necessary. Of the 20 forests within the region 17 reported increasing barkbeetle infestations.

The following table shows the status of the different insects reported.

II.

SUMMARY OF INSECTS REPORTED

INSECT	YEAR	INCREASING	DECREASING	NORMAL	TOTAL
Mountain Pine Beetle	1931	49	25	13	87
	1930	60	24	14	98
D. Monticolae Hopk.	1929	45	14	23	82
	1928	33	13	10	56
Western Pine Beetle	1931	2	1	1	4
	1930	4	1	0	5
D. brevicomis Lec.	1929	0	3	4	7
	1928	5	4	2	11
Douglas Fir Beetle	1931	2	5	1	8
	1930.	4	2	4	10
D. Pseudotsugae Hopk.	1929	2	1	2	5
	1928	5	4	2	11
Lodgepole Pine Beetle	1931	0	0	1	1
D. murrayanae Hopk.	1930	0	0	1	1
Fir Beetle	1931	0	0	1	1
Scolytus ventralis Lec.	1930	2	0	0	2
(Scolytus subscaber)	1929	1	0	0	1
	1928	0	0	1	1
Balsam Beetle	1931	0	0	0	0
Dryocoetes confusus Sw.	1930	1	0	2	3
Spruce Budworm	1931	1	7	1	9
Cocoecia fumiferana Clem.	1930	6	5	6	17
	1929	4	9	3	16
	1928	11	12	4	27
Pine Butterfly	1931	0	0	0	0
Neophasia menapia Felder	1930	1	0	0	1
	1929	1	0	0	1

The above table is but a tabulation of the reports received, and does not present a very true picture of conditions. From some ranger districts where a general infestation exists throughout the entire area, but one report was submitted, while from others with comparable situations, separate reports for the main drainages were made. This fact makes the depiction of actual conditions from the number of reports rather difficult.

From the data as submitted, there has been a marked decline in the number of mountain pine beetle infestations in white pine. In 1928 there were 27 outbreaks of this character reported, 18 of which were considered as increasing. In 1929 there were 40 reported with 24 considered as increasing; 42 in 1930 with 22 given as increasing; and 28 in 1931 with 11 having increasing infestation. The following table shows the number and status of ranger reports covering mountain pine beetle infestations in white pine which were submitted from the different forests.

Forests	No. Reports	Prev Rep'd	1st Rep'd 1931	Increasing	Decreasing	Normal	Control Recommended
Blackfeet	2	2			2		No
Cabinet	2	1	1		2		No
Clearwater	4	4		1	2	1	No
Coeur d'Alene	3	3		1	2		Yes
Flathead	1	1				1	No
Kaniksu	5	5		1	3	1	No
Kootenai	1	1		1			Yes
Pend Oreille	7	5	2	4		1	No
St. Joe	3	3		3			Yes
	28	26	3	11	11	4	for 2 areas

It is rather difficult to picture existing conditions from the above table. Available data would indicate that there was a rather definite decline in the severity of the mountain pine beetle in white pine. Though such a condition would hardly seem to exist on the Coeur d'Alene, Kootenai and Pend Oreille, it is hoped that it may be true for the other areas.

The mountain pine beetle infestation in lodgepole pine continues in its former seriousness. Of the 20 forests, 18 reported infestations of which 16 are increasing. The following table gives the number and status of ranger reports received from the different forests with mountain pine beetle infestations in lodgepole.

Forest	No. of Reports	Reported Prior 1931	First Reported 1931	Increasing	Decreasing	Normal	Control Recommended
Beaverhead	7	7		5		2	For 2 areas
Bitterroot	13	13		11		2	" 3 "
Blackfeet	2	2		1	1		No
Cabinet	1		1		1		No
Clearwater	4	4		3	1		For 1 area
Coeur d'Alene	1	1		1			Yes
Custer	2	2			1	1	No
Deerlodge	5	5		3	2		No
Flathead	1	1				1	No
Gallatin	2	1	1	1	1		Yes
Helena	4	4		2	1	1	For 3 areas
Kootenai	3	3		2	1		" 1 "
Lewis & Clark	1	1		1			No
Lolo	10	3	7	4	4	2	" 2 "
Nezperce	3	3		3			No
Pend Oreille	3		3	2	1		No
Selway	3	3		3			Yes
St. Joe	1	1		1			Yes
	66	54	12				

The above table depicts a serious infestation as existing throughout the entire region. From an intensive survey of the Beaverhead we know that there were some 12,000,000 trees attacked in 1931. In the Bitterroot the insects have

spread northward down the valley infesting both lodgepole and yellow pine. The future of the Montana outbreak is difficult to predict, but with the apparent increase in severity during the past season, tremendous additional losses are bound to occur. In 1930 there were but 55 infestations reported with 39 of them listed as increasing, while in 1931, there were 12 new outbreaks reported, making a total of 66, with 42 of them considered as increasing.

The Idaho situation is perhaps even more serious as there is but little doubt that the severe outbreak in the Idaho National Forest is spreading northward through the Nezperce and Selway Forests. One can hardly foresee, or at least dare to predict, what such a spread may mean to the valuable timber stands which lie in the path of this outbreak.

Three infestations of the western pine beetle, (Dendroctonus brevicomis Lec.) were reported from the Custer and Deerlodge Forests. One infestation on the Custer was considered as increasing; however, no control was recommended.

There were 8 outbreaks of the Douglas Fir beetle (Dendroctonus pseudotsugae Hopk.) reported from the Absaroka (1), Blackfoot (2), Cabinet (1), Flathead (3), and Nezperce (1). Of these outbreaks but 2, one on the Blackfoot and one on the Nezperce, were considered as increasing; however, no control was recommended. There is a rather general infestation of this insect throughout the Douglas fir forests of the Region and there are, no doubt, several outbreaks which have not been reported.

Reports of the spruce budworm (Cacoecia fumiferana Clem.) were received from five forests as follows: Absaroka (1), Gallatin (1), Helena (2), Kesperce (1), Selway (4). Though seven of these outbreaks were recorded as increasing, it would seem that there has been a decrease in the severity of these infestations, because in 1930 there were 17 reports received though only 5 were listed as increasing.

1931 FIELD SEASON

Beaverhead National Forest

The progress of the mountain pine beetle epidemic within the lodgepole pine stands of the Beaverhead National Forest was again followed by an extensive survey conducted by the Bureau of Entomology. The data secured from this survey contributes towards a better understanding of the spread and rate of increase that can be expected from infestations of this character. The data show that a severe infestation now exists throughout the entire forest. In 1931 there were 12,236,732 trees attacked as against 3,835,958 in 1930; 2,084,123 in 1929; and 321,372 in 1928. This project will be continued in 1932, with more attention being given to the volume of timber remaining, susceptibility of certain timber types, etc.

Kootenai National Forest

Control measures were conducted on thirteen white pine areas during the spring of 1931, against outbreaks of the mountain pine beetle. Approximately 4,693 trees were treated at a total cost of $24,500. A survey of this forest conducted during the past season shows that though on most of the areas a very substantial reduction followed the 1931 operation, a reinfestation occurred for which some $12,650. would be required to effect a clean-up during the 1932 season.

Coeur d'Alene National Forest

Control measures were again instituted on the Coeur d'-Alene Forest, during the fall of 1930 and the spring of 1931, in combating an outbreak of the mountain pine beetle in white pine. During these two periods some 7,112 trees were treated at an approximate cost of $45,790. A survey of the area during August and September indicated that there were still some 8,721 trees which should be treated, requiring an expenditure of approximately $50,000. The results of the 1931 operation were effected materially by an abnormal number of windfalls throughout the forest, resulting from a severe windstorm in April 1931. A large per cent of these windthrows were lightly attacked by the mountain pine beetle during the past season, and as heavy insect broods are produced in such material, it was necessary to consider each windfall as a "bug tree" requiring treatment even though lightly attacked. This factor increased the number of trees requiring treatment in 1932 by a large percentage.

Glacier National Park

In the fall of 1930 control measures were instituted against an outbreak of the Douglas fir beetle in Douglas fir at the head of Lake McDonald. Though there were scattered infestations of this beetle throughout the west side of the park, this project was instituted for the express purpose of trying to protect the scenic properties of the forests adjacent to the McDonald Hotel. During the 1931 season, insects spread into this area from adjacent regions making the project

a failure, and eliminating any further work as being both entomologically and economically unsound.

Control measures were again instituted in the spring of 1931 in an attempt to eliminate the mountain pine beetle from the pine forests of the upper Lake McDonald region. As this infestation is now present throughout all of the pine forests of the west side and is spreading into the control units, further work has been abandoned.

Infestations of the mountain pine beetle in the lodgepole pine stands on the east side of the park were discovered during the past season. Control measures will be instituted during the coming spring in the hope that destructive outbreaks can be prevented.

Tongue River Indian Reservation

Control measures were instituted during the spring of 1931 to combat an outbreak of the Black Hills beetle which had been reported from the yellow pine stands of the Tongue River Indian Reservation during the previous season. During this operation, which was directed against local centers of infestation, 134 trees were treated. A survey conducted during the past season shows that there are approximately 336 trees scattered over some 20 sections, which should be treated during the coming season. The project as conducted in 1931 was very successful in reducing the centers of infestation where the work was conducted.

Yellowstone Park Project

Control work in connection with what has become known as the Yellowstone Park project, was conducted on the Targhee, Teton, Wyoming, Caribou, and Cache National Forests of Region 4; the Madison National Forest of Region 1, and the Yellowstone National Park.

The following table shows the extent of the work as conducted in 1931:

Forest	Acres	Trees Treated	Cost
Beaverhead (Madison)	16,234	5,870	$22,976.
Yellowstone Park	12,344	2,888	7,767.
Targhee	102,670	32,316	42,571.
Teton	4,500	4,762	6,717.
Wyoming	105,000	17,055	57,645.
Caribou	14,980	11,539	16,556.
Cache	34,000	9,150	7,332.
	289,728	83,580	161,566.

A survey of the different units of this project conducted during August and September 1931, show a marked increase in the infestation during the past season, there now being some 231,000 trees requiring treatment during the coming season. In view of the uncertainty of this project, and the large sums of money involved, this project has been discontinued.

Shoshone National Forest

During the past season an outbreak of the Douglas fir beetle was recorded in the Cody Canyon of the Shoshone National Forest. The insects were working in the Douglas fir stands which had been severely defoliated by the spruce budworm during the past few years. Control measures were instituted during October and some 12,000 trees treated at a cost of 76¢. As a result of this operation, a marked reduction in the infestation is expected.

CONTROL PLANS FOR THE 1932 SEASON

With the realization that their institution depends upon the appropriation of required funds which as yet have not been made available, the following control projects have been recommended for the spring of 1932.

Coeur d'Alene National Forest	$53,000.00
Kootenai National Forest	12,000.00
Glacier National Park	2,000.00
Tongue River Indian Reservation	1
Shoshone National Forest	1

ENTOMOLOGICAL INVESTIGATIONS

Practically the entire time of the investigative force of this station has been spent in studies of destructive barkbeetles, due to the economic pressure of the problem. These studies have been directed towards the development of more economical and effective methods of control for these destructive insects. Other suggested leads have been previously exhausted, work relative to actual control measures has been confined to the injection of infested trees with different poisons. In 1930 a large number of infested lodgepole pine trees were treated in this manner. Though an examination that fall indicated discouraging results, subsequent data taken in the spring of 1931, showed that the overwintering broods in trees treated with sodium arsenate, had been destroyed. Following this promising lead, additional lodgepole pine and white pine were treated in 1931, the results of which will be available in 1932. This method of barkbeetle control has its greatest field in the treatment of white pine where, under our present system, the cost per tree is very high.

To determine the effectiveness of burning-standing control as practiced against outbreaks of the mountain pine beetle in lodgepole pine, an investigation was instituted in the spring of 1931 in connection with control work on the Wyoming National forests. A large number of treated trees were examined and the data secured showed the method as practiced in 1931, where all of the large, tall trees were felled for treatment, to be effective.

To learn more of the flight habits of barkbeetles so that control projects could be more effectively planned, "Glick" traps were used in connection with an aerial survey of the Yellowstone Park. Plans to use these traps in cooperation with the forest patrol did not materialize due to the severe fire season of 1931. Though a number of insects were taken in these traps at different elevations, no barkbeetles were secured as these flights were made before the new adults had started to emerge from the trees. Weather vane traps were set on lookout peaks on the Coeur d'Alene and Kaniksu National Forests. Adult mountain pine beetles were taken in these traps, showing that they do fly over timberless mountain tops, apparently following air currents.

Intensive studies were conducted of the mountain pine beetle and the Douglas fir beetle. The studies were directed toward clarifying confusing points in seasonal histories and habits. The emergence of these two insects from the first tree attacked and successful re-attack of a second, was proved for the 1931 season. This dual attack increases the potential danger of emerging broods, and offers an explanation as to the source of some of the unexplainable reinfestations which occur from time to time. Such items as parasites and predators, sex ratio, parthenogenesis, period of time over which the new attacks extend, seasonal histories, habits, etc. received attention during this study.

To secure a better understanding of the spread of mountain

pine beetle epidemics in lodgepole, an extensive survey of the Beaverhead Forest was again conducted during the past season. From this project such information as the rate of spread, severity of the destruction, per cent of stand remaining after the epidemic had passed, length of time such outbreaks last within an area, susceptibility to attack, different age classes, timber types, and exposures, is being secured. Data from this survey show that during the 1931 season there were some 12,000,000 trees attacked.

To develop a satisfactory method of control to protect trees with high aesthetic or commercial values from the spruce budworm, an experimental spraying project was instituted during June 1931 against an outbreak of this insect in the Cody Canyon. Though a number of different sprays were used at different times of the season, the results of these experiments were seriously affected by a marked reduction in the general infestation, which made the measurement of their effectiveness very difficult.

A study of the Oregon Engraver Beetle (Ips oregoni Eich.) which from time to time becomes a serious destroyer of pine reproduction and small trees, was instituted during the past season. The purpose of this study is to determine the factors responsible for the development and cessation of these sporadic outbreaks, as well as the development of more effective control measures than those now in use.

Other studies such as the interrelation of forest fires and subsequent insect outbreaks, logging debris and insect outbreaks, etc., have and will continue to receive attention.

CONCLUSIONS

Utilizing all available sources of information relative to existing conditions within the region, would indicate that there had been little if any cessation in the seriousness of the barkbeetle epidemics which have confronted us for the past few years. The future of this condition is difficult to foresee. Though it would seem that there has been a rather marked reduction of the outbreaks of the mountain pine beetle in white pine, the infestation in lodgepole is still assuming serious proportions and can be viewed with alarm.

Though the rangers' reports continue to show improvements in the character of the data submitted, it is believed that more time should be made available for field examinations, the data from which would present a far clearer picture than can be made from casual observations. The ranger's personal reaction to the situation upon which he is reporting, would be of value. Often the small space on the form which is left for remarks is ignored, while in other instances, valuable data are given. The back of the form could be utilized for more detailed remarks if additional space is necessary. The supervisors' summaries contained much worthwhile information, and it is trusted that this practice will be continued.

Insects are receiving more attention in programs of forest protection than ever before. This is extremely gratifying as the solution of the forest insect problem lies in preventing epidemics,

rather than suppressing them. To prevent the occurrence of destructive epidemics which are expensive and difficult to control, outbreaks must be recognized and reported while in their incipiency. Control measures instituted against such situations, are not only less expensive, but are often productive of more efficient results.

To secure information which will permit outbreaks to be attacked in their early stages of development, prompt recognition and action are necessary. All trees with discolored foliage must be considered as an indication of danger and more intensive examinations made. It is only from such information that action can be taken, as the mere recording of an insect within an area does not provide sufficient data upon which to base recommendation for control. The ranger occupies an important position in the recording and reporting of insect outbreaks, and it is to him that one must turn for information as to the exact status of conditions within his district.

Respectfully submitted,

James C. Evenden, Entomologist.

Affirmed,

Elers Koch, Asst. Regional Forester.

SUMMARY TABULATIONS OF RANGER REPORTS

Forest & Ranger Dist	Insect	Host	Increasing: Decreasing:	First Reported	Control Recommended
ABSAROKA N. F.					
Bolder District	Dps	DF	Decreasing	1924	No
Yellowstone (Fridley Cr)	Sp.Bw.	DF & ES	Decreasing	1931	No
Yellowstone (Miller Cr)	Needle cast	DF & LPP	Stationary	1922	No
Park	No infestations noticed				
Shields	No infested areas to report				
BEAVERHEAD N. F.					
No. 1 (Dillon)	MPB	LPP	Increasing	1930	No
No. 2 (Wise River)	MPB	LPP	Increasing	1929	No
No. 3 (Wisdom)	MPB	LPP	Increasing	1926	Yes
Jackson #4	MPB	LPP	Increasing	1925	No
Lima #5	MPB	LPP & SP	same	1930	Yes
Sheridan	MPB	LPP	Increasing	1929	No
Ruby	MPB	LPP	same	1930	No
Madison	No infestations - Refer to Neil Fullerton's report				
BITTERROOT N. F.					
Paradise	MPB	LPP,EBP,YP	Increasing	1930	Yes
Salmon	MPB	LPP	Increasing	1926	No
West Fork	MPB	LPP	Increasing	1925	No
East Fork	MPB	LPP,YP,WBP	(Increasing YP Decreasing LPP	1924	No
Darby	MPB	LPP & YP	Increasing	1924	No
North End	MPB	LPP	Increasing	1928	No
North End (Soft Rock Cr)	MPB	LPP	Decreasing	1928	No
BLACKFEET N. F.					
Fortine (Murphy Cr)	Dps	DF	Decreasing	1910	No
Fortine (Clarence Cr)	MPB	WP	Decreasing	1925	No
Tally Lake	MPB	LPP	Decreasing	1925	No
Tally Lake	Dps	DF	Increasing		No
Lower N. Fork	D.m	LPP	Normal		No
Lower N. Fork	MPB	WP	Decreasing	1925	No
Upper N. Fork	MPB	LPP	same	1927	No
CABINET N. F.					
Noxon	D.ps	DF & WP	Decreasing	1931	No
Noxon	D.m	WWP	Decreasing	1929	No
District #1	Ips oregoni	YP	Decreasing	1931	No
Plains #2	No infestation				
Thompson Falls	Ips ?	LPP,DF,LWP	Increasing	1931	No
Trout Creek	No infestation				
Savanac	MPB	LPP, WP	Decreasing	1931	NO

Forest & Ranger Dist.	Insect	Host	Increasing: Decreasing:	First Reported:	Control Recommended
CLEARWATER N. F.					
Musselshell Dist	MPB	LPP	Increasing	1924	Yes
Musselshell (Lodo & Musselshell Cr)	MPB	WP	Decreasing	1924	No
Oxford	No Infestations Reported				
Canyon	WPB	WP & LPP	Decreasing	1924	No
Chamberlain	MPB	WP	Normal	1924	No
Kelly Cr. (Mink Cr. & Little Moose)	MPB	LPP	Increasing	1930	No
Cook Mt.	MPB	WP, WBP, LPP	Increasing	1924	No
COEUR D'ALENE N. F.					
Little River Dist	MPB	WP LPP	Increasing	1925	Yes
Shoshone Dist	No ranger report - see note by Howard Drake				
Grizzly Mt. Dist) Steamboat Drainage)	MPB	W P	Decreasing	1928	Yes
Forks Dist. (Potter, Big Elk & Stewart Crs.)	MPB	WP	Decreasing	1928	Yes
CUSTER N. F.					
Rock Cr. (formerly Bear Tooth)	MPB	LPP	Decreasing	1924	No
Poker Jim	MPB	WYP	Stationary	1925	No
Poker Jim	WPB	WYP	Stationary	1927	No
Whitetail	WPB	WYP	Increasing	1928	No
Short Pine #6	No infestations				
Ekalaka	Ants	?	?	1931	
Stillwater (formerly Beartooth)	Pine Leaf Scale YP & LPP		?	1931	No
Long Pines - Buffalo	Small areas show past Ips infestation				
DEERLODGE N. F.					
Philipsburg	MPB	LPP	Increasing	1921	No
Whitetail	None to Report			1929	
Boulder	MPB	LPP	Increasing	1928	No
Butte	MPB	LPP	Decreasing?	1930	No ?
Deerlodge	MPB	LPP	Decreasing	1920	No
Deerlodge	W P B	YP	Decreasing	1920	No
Anaconda	MPB	LPP & WBP	Increasing	1924	No
FLATHEAD N. F.					
Big River	No evidence of insect infestations found				
Big Prairie	MPB	LPP	Normal	1926	No
Coram (Skyland Ridge)	D.ps.	DF & SP	Decreasing	1929	No
Coram (Desert & Great Bear Mts)	D.ps.	DF	Decreasing	1930	No
Elk Park	MPB	WP	?	1926	No
Upper Swan	Normal Conditions				
Spotted Bear	D.ps	DF	Normal	1931	No
Lower Swan	Reference is made to report by White & Leibig, May 1931.				

Forest & Ranger Dist	Insect	Host	Increasing: Decreasing:	First Reported:	Control Recommended
GALLATIN N. F.					
Basin No. 2	Ips	WBP	Decreasing	1931	Yes
Basin No. 2	MPB	WBP	Decreasing	1931	Yes
District No. 4	MPB	LPP & WBP	Increasing	1927	Yes
District No. 5	Sp. Gall	DF & Sp	Decreasing	1930	No
District No. 5	LPP Needle rust	LPP	Decreasing	1930	No
District No. 1	Sp. Bw.	?	Stationary	1931	No
District No. 1	DF Needle cast	DF	Decreasing		No
District No. 1	Woolly Aphid	DF	Decreasing		No
District No. 1	Red Spider Mites	DF	Increasing		No
HELENA N. F.					
Deep Cr;- Crow Cr.#1	MPB	LPP	Increasing	1924	Yes
Deep Cr.- Crow Cr.#1	Sp. Bw.	DF	Increasing	1924	No
Checkerboard	MPB	LPP	Decreasing	1931	Yes
Duck Creek	Sp. Bw.	DF	Decreasing	1930	No
Blackfoot	MPB	LPP	same	1925	No
Helena	No infestations				
Lincoln	No infestations				
KANIKSU N. F.					
Cusick	MPB	WP	Increasing	1924	No
Falls	MPB	WP	same	1927	No
Coolin	MPB	WP	Decreasing	1924	No
Beaver Creek	MPB	WP	Decreasing	1924	No
Sullivan Lake	MPB	WP	Decreasing	1924	No
Bismark	No infestations				
KOOTENIA N. F.					
Worland Dist No.7	MPB	LPP	Increasing	1925	No
Rexford Dist No.8	MPB	LPP	Decreasing	1927	No
Fisher Dist No. 6	MPB	WP & LPP	Increasing	1927	Yes
LEWIS & CLARK N. F.					
Dry Wolf	MPB	YP	Increasing	1925	No
Sun River Dist #4	MPB	LP	Increasing	1924	No
LOLO N. F.					
Frenchtown	MPB	LPP	[illegible]creasing		
Frenchtown	MPB	LPP & WBP	[illegible]reasing	1931	
Monture	MPB	LPP	[illegible]	1931	No
Missoula (Gold Cr.)	MPB	LPP & WBP	[illegible]s	1930	No
Missoula (Miller Cr.)	MPB	LPP	[illegible]reasing	1931	No
Missoula (E.Fk.Rattlesnake)	MPB	LPP	[illegible]reasing	1931	No?
Missoula (Grant Cr.)	MPB	LPP & WBP	Increasing	1931	No?
Seeley Lake	MPB	LPP	[illegible]reasing	1931	Yes
Bonita	MPB	LPP	Decreasing	1926	Yes
					No
					No

(Cont'd. on following page)

Forest & Ranger Dist	Insect	Host	Increasing: Decreasing:	First Reported:	Control Recommended
GALLATIN N. F.					
Basin No. 2	Ips	WBP	Decreasing	1931	Yes
Basin No. 2	MPB	WBP	Decreasing	1931	Yes
District No. 4	MPB	LPP & WBP	Increasing	1927	Yes
District No. 5	Sp. Gall	DF & Sp	Decreasing	1930	No
District No. 5	LPP Needle rust	LPP	Decreasing	1930	No
District No. 1	Sp. Bw.	?	Stationary	1931	No
District No. 1	DF Needle cast	DF	Decreasing		No
District No. 1	Woolly Aphid	DF	Decreasing		No
District No. 1	Red Spider Mites	DF	Increasing		No
HELENA N. F.					
Deep Cr:- Crow Cr.#1	MPB	LPP	Increasing	1924	Yes
Deep Cr.- Crow Cr.#1	Sp. Bw.	DF	Increasing	1924	No
Checkerboard	MPB	LPP	Decreasing	1931	Yes
Duck Creek	Sp. Bw.	DF	Decreasing	1930	No
Blackfoot	MPB	LPP	same	1925	No
Helena	No infestations				
Lincoln	No infestations				
KANIKSU N. F.					
Cusick	MPB	WP	Increasing	1924	No
Falls	MPB	WP	same	1927	No
Coolin	MPB	WP	Decreasing	1924	No
Beaver Creek	MPB	WP	Decreasing	1924	No
Sullivan Lake	MPB	WP	Decreasing	1924	No
Bismark	No infestations				
KOOTENIA N. F.					
Worland Dist No.7	MPB	LPP	Increasing	1925	No
Rexford Dist No.8	MPB	LPP	Decreasing	1927	No
Fisher Dist No. 6	MPB	WP & LPP	Increasing	1927	Yes
LEWIS & CLARK N. F.					
Dry Wolf	MPB	YP	Increasing	1925	No
Sun River Dist #4	MPB	LP	Increasing	1924	No
LOLO N. F.					
Frenchtown	MPB	LPP	Decreasing	1931	No
Frenchtown	MPB	LPP & WBP	Decreasing	1931	No
Monture	MPB	LPP	same	1930	No
Missoula (Gold Cr.)	MPB	LPP & WBP	same	1931	No?
Missoula (Miller Cr.)	MPB	LPP	Increasing	1931	No?
Missoula (N.Fk.Rattlesnake)	MPB	LPP	Increasing	1931	Yes
Missoula (Grant Cr.)	MPB	LPP & WBP	Increasing	1931	Yes
Seeley Lake	MPB	LPP	Decreasing	1931	No
Bonita	MPB	LPP	Decreasing	1926	No

(Cont'd. on following page)

Forest & Ranger Dist.	Insect	Host	Increasing: Decreasing	First Reported	Control Recommended
LOLO N. F. (Contd)					
Powell (Upper Lochsa)	MPB	LPP	Increasing	1930	No.
Lolo	No infestations				
Quartz	No infestations				
Superior	No infestations				
NEZPERCE N. F.					
Red River Dist	MPB	LPP	Increasing	1930	No
Dixie	MPB - LPP & Subalpine		Increasing	1924	No
Slate Creek	D.b.-D.m.-D.ps.)	DF, LPP, YP. "		1924	(Suggests Inves
Clearwater	Sp.Bw.-All fir & Sp. type		Decreasing	1924	No
Salmon River	No insect infested areas to report				
PEND OREILLE N. F.					
Myrtle Cr. (Ball Cr.)	MPB	WP, LPP & Sp.	Slight Incr.	1931	No
Sandpoint	MPB	WP	Normal	1926	No
Moyie	No infestations				
Smith Cr.	MPB	WP	Increasing	1924	No
Smith Cr. (Boundry Cr)	MPB	WP	Increasing	1924	No.
Shiloh	MPB	LPP, subalpine	Decreasing	1931	No
SELWAY N. F.					
Moose Cr.	MPB	YP, LPP	Increasing	1927	Yes
Meadow Cr.	Sp.Bw.	WF & DF	Decreasing	1927	No
Selway	Sp.Bw.	WF	Decreasing	1926	No
Middle Fork	Sp.Bw.	DF, WF, Sp.Alp.	"	1926	No
Lochsa	MPB	WBP	Increasing	1925	Yes
Bear Creek (Indian Cr)	MPB	YP & LPP	Increasing	1924	Yes
Bear Cr. (Dog Cr. to Cont Cr.)	MPB	YP & LPP	Increasing	1924	Yes
Bear Cr. (Martin Cr.)	Sp.Bw.	WF & DF	Decreasing	1926	No
ST. JOE N. F.					
Avery	MPB	WP & LPP	Increasing	1926	Yes
Palouse	No infestations to report				
Ward's Peak	Ips	LPP	Increasing	1931	No
" " (Simmons Cr)	MPB	WP	Increasing	1929	Yes
" " (Entire Dis)	Soloytus Subsenber	WF	Normal	1930	No
Slate Cr.	Sp.Gall Aphid	Spruce	Increasing	1931	No
Round Top	MPB	WP	Slight increase	1925	No